



High performance marine diesels

TAMD 70C
THAMD 70C

40600





TAMD 70C and THAMD 70C – now with even higher output

This brochure presents the new and more powerful versions of the renowned Volvo Penta, seven-litre engines, more than 1,000 of which have been sold all over the world.

The new designations are TAMD 70C and THAMD 70C. Output has been increased by as much as 22 kW/30 h.p. to 206 kW/280 h.p. (Propeller shaft output 198 kW/270 h.p.) This means that the engines now have exceptionally high output in relation to weight and installed dimensions – 3.35 kg per shaft horsepower including reverse gear. Compare this with other engines in the same output class!

This increased output has been attained by using a new Turbo-compressor supercharger and new injection equipment. The engines have also been fitted with new rubber mountings and piston cooling has also been introduced on the vertical version. These improvements, together with certain others, have made their contribution to even smoother and quieter running with less vibration.

Model 70 engines are designed right from the very beginning to stand up to extremely severe stresses. Their operational dependability is well-documented and also their low fuel consumption. As a matter of fact fuel consumption is 10–25% lower than those of many competitor engines in the same class. This means that boats powered by Volvo Penta TAMD 70C and THAMD 70C have a particularly large radius of action in relation to fuel tank capacity. And the less fuel you need to have on board, the lighter – and faster – the boat is. The model 70 engines are thus available in two versions, one vertical (TAMD 70C) and one horizontal (THAMD 70C) where H means horizontal. The rest of the abbreviation means a Tur-

bo-supercharged marine diesel fitted with an aftercooler. The figure 70 represents the swept volume in decilitres.

Both engines have the same excellent performance but the horizontal version, the expansion tank of which has an extra low profile, is as much as 300 mm lower than the vertical version. This means that the horizontal version can be installed under the floor in craft such as motor cruisers.

The basic design of the model 70 engines is relatively simple and uncomplicated and they are of six-cylinder in-line type. A renowned type of engine that is simple to install and simple to service. These new engines represent all the experience acquired from more than a quarter of a million similar diesel units manufactured by Volvo. A type of engine with an outstanding reputation for dependable and safe running.

The Volvo Penta model 70 engines have been submitted to even more severe bench tests and fatigue tests for tens of thousands of hours. They have naturally also been tested under extremely severe conditions of operation in different types of boats.

But no engine is better than service it gets. Therefore, for many years Volvo Penta has been continuously extending and improving a network of service stations which now covers more than 100 countries all over the world.

This brochure includes quite a lot of information about the model 70 engines. But there is naturally much more to say about them. If you would like to have even more detailed information, drop us a line or contact your nearest Volvo Penta dealer. We look forward to hearing from you.

Facts about the model 70 engines

The Volvo Penta TAMD 70C/THAMD 70C are direct injection, in-line, six-cylinder diesels supercharged by an exhaust gas driven Turbo-compressor and fitted with an aftercooler. The TAMD 70C including reverse gear weighs only 920 kg (2030 lbs.) and the corresponding weight for the THAMD 70C is 980 kg (2160 lbs). In spite of the extremely compact design of the engines, all the components are robustly dimensioned. Crankshafts, connecting rods, big-end bearings and gudgeon pins are manufactured with an extra margin of safety. Volvo Penta has carried out very extensive development work on this type of engine in order to attain absolutely dependable cylinder head sealing. The result of this work is solid steel gaskets, one for each cylinder head.

The new model 70 engines are fitted with an even more ef-

Turbo

The increase in output from 184 kW to 206 kW (250–280 h.p.) has been attained by using a new Turbo-compressor which provides an even higher supercharging pressure. Another new feature is that the exhaust system has one single gas channel which provides better flow.

The fuel injection equipment, which has been modified on the vertical engine, has been precision adapted to the new Turbo which is based on the wide range of experience from hundreds of thousands of Turbo engines manufactured during the years in the Volvo factories. As a matter of fact, Volvo has series-manufactured Turbo-diesels since the 1950's and is, in other words, a pioneer in this field.

The Turbo consists of an exhaust gas driven compressor which feeds the cylinders with air under pressure. Because of this surplus air, the engine can burn more fuel per unit of cylinder volume, the result being an extra high output. The Turbo has many advantages, for example the increased output is attained without it being necessary to utilize any of the engine power since it is the exhaust gases that power the turbine unit. Furthermore, from the environmental viewpoint, the Turbo engine is excellent – a lower noise level, cleaner exhaust gases. The Turbo bearings are lubricated and the bearing housing is cooled by using oil from the engine pressure lubrication system. The exhaust turbine driving the compressor is fresh-water cooled.

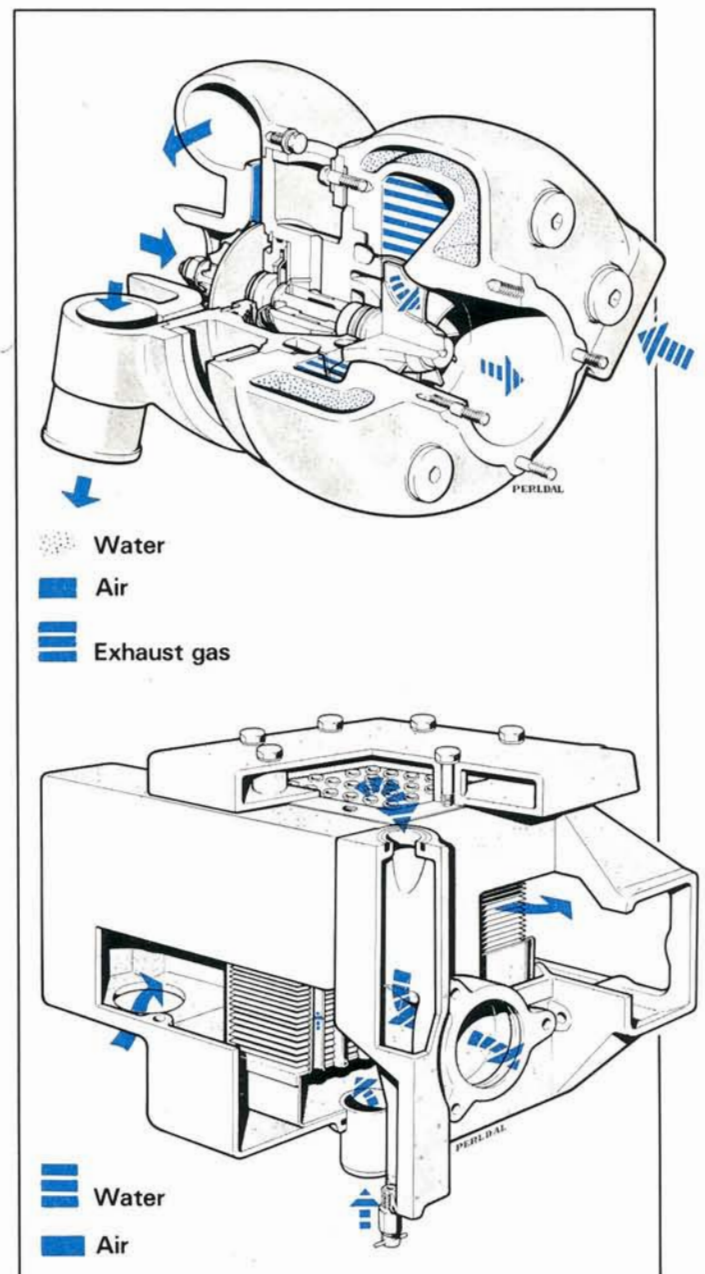
Aftercooler

The air is compressed to a marked extent by the Turbo unit, this increasing the charging temperature considerably. For this reason both the TAMD 70C and THAMD 70C are fitted with an effective aftercooler. When the compressed air is cooled, the degree of supercharging increases and engine output is considerably higher than it would be with un-cooled air. Aftercooling is so well balanced that a very high engine output can be attained without exhaust temperature and combustion pressure increasing too much. This has a favourable effect on the lifetime and operational dependability of the engine. The aftercooler is fitted with vertical tubes, this eliminating the risk of deposits which can result in corrosion. The tubes are made of a special high-grade copper-nickel alloy.

fective Turbo-compressor which has made possible an increase in output to 206 kW (280 h.p.) Aftercooling is carefully adapted so that, in spite of high output, the exhaust temperature and combustion pressure of the engine still remain within reasonable limits, this being a vital condition for operational dependability and a long life.

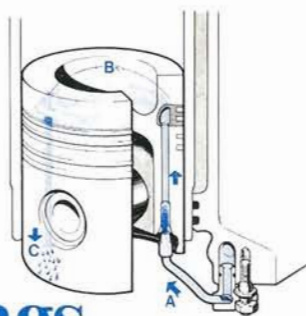
The engines are fresh-water cooled by using a very effective heat exchanger made of corrosion-resistant material. The heat exchanger insert can be taken out and is therefore easy to keep clean.

The model 70 engines are available with both 12 V and 24 V electrical systems. Engine installation is simplified by the fact that there is only one combined terminal block for all the electrical cables except those to the starter motor.



Piston cooling

Both engine versions are now fitted with piston cooling. A fixed oil nozzle injects cooling oil continuously into each piston. The oil then passes round inside the piston and runs down to the sump through a hole in the underside of the piston.

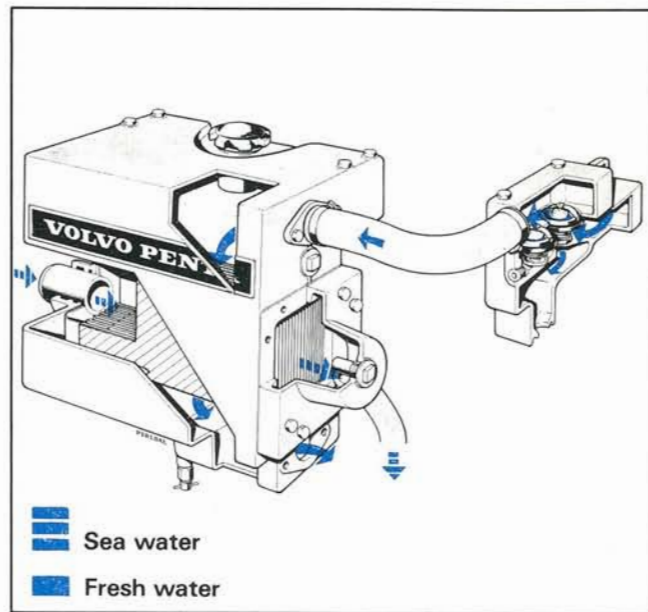
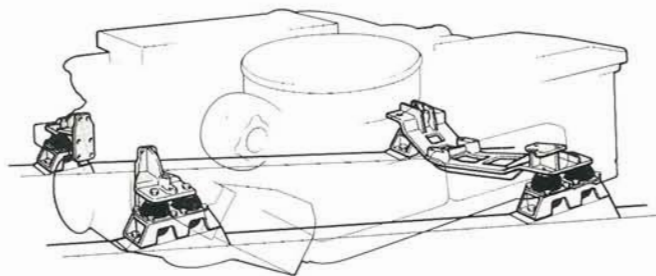


- A Oil nozzle
- B Piston
- C Oil to the sump

New engine mountings

The TAMD 70C and THAMD 70C are fitted with a new and thoroughly developed system of mountings which decreases both noise and vibration. The rear engine mountings have been moved rearwards and upwards to the reverse gear and, on the horizontal engine, the front mountings have been moved forward by modification of the lower member, this ensuring even better accessibility.

The mounting kits also include the lower attachments for the rubber blocks, this facilitating installation since it is not necessary to make recesses for the blocks in the engine bed. Special adjuster screws are available for exact engine alignment.



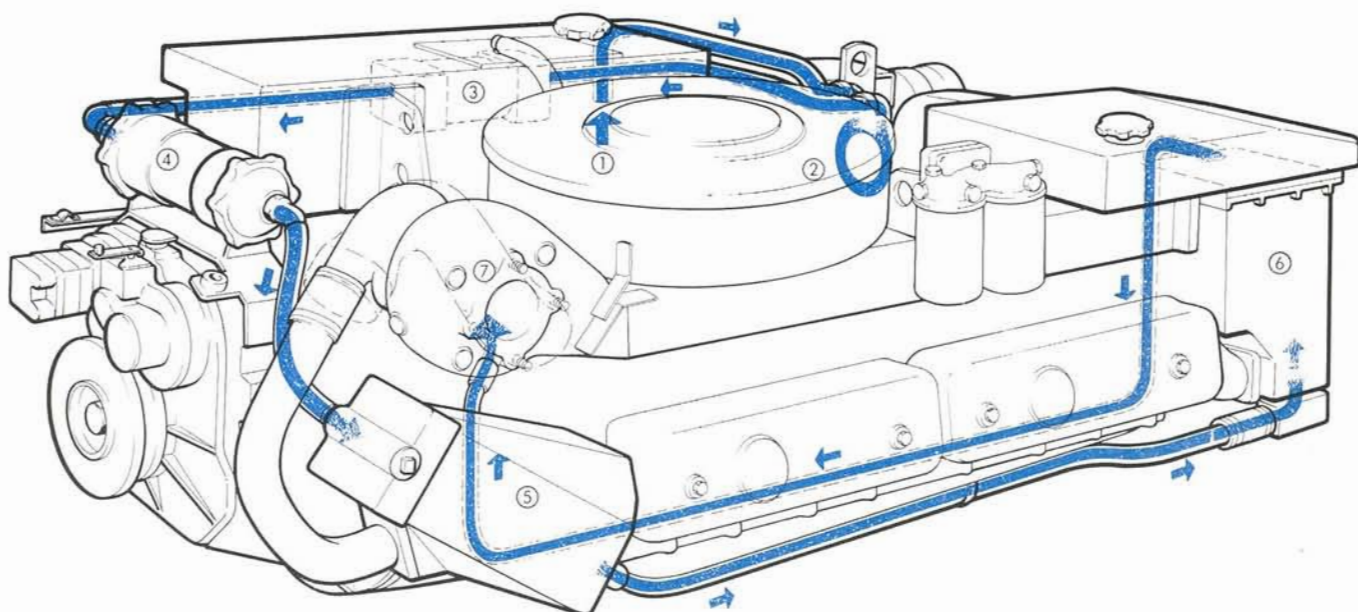
- Sea water
- Fresh water

Fresh-water cooling

The model 70 engines have freshwater cooling using a sealed system with double thermostats. The freshwater circulating inside the engine is, in its turn, cooled by seawater in a special heat exchanger. This implies that the important internal components of the engine are completely protected from salt water which could otherwise give rise to deposits and corrosion.

Heat exchanger

The tubes in the heat exchanger are easy to clean and are made of copper-nickel alloy. The heat exchanger housing is designed as an expansion tank for freshwater and includes the thermostat housing to control the cooling water temperature.



The picture shows the path followed by the sea water from the cooling water intake (1), pump (2), engine oil cooler (3),

reverse gear oil cooler (4), induction air aftercooler (5), and finally to the heat exchanger (6) and the cooling water outlet (7).

Lubricating system

The lubricating oil pump sucks up oil from the sump and forces it out to the various lubricating points inside the engine. This pump is very robustly dimensioned and guarantees fully satisfactory lubrication even when the engine is running at idling speed.

The engine bearings, the rocker arm mechanism and the auxiliary drive gears are lubricated through drillings in the cylinder block, cylinder heads, crankshaft and connecting rods. Other parts are taken care of by splash lubrication. The Turbo-compressor and the fuel injection pump are lubricated through drillings from the main lubricating galleries.

The filters are of the modern spin-on type with top quality paper inserts and can be replaced quickly and easily. The filters are fitted to a sturdy bracket with internal drillings which means that the engine has a clean profile without external pipelines and connections.

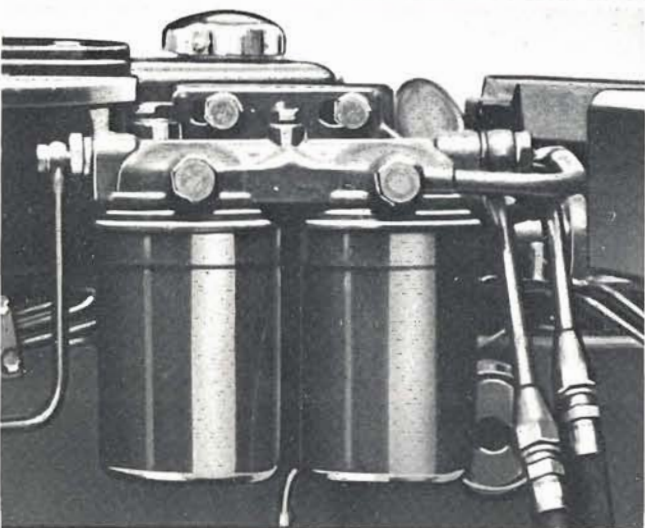
Lubricating oil coolers

It is very important for the function of the engine and its lifetime for the lubricating oil to be properly cooled. For this reason the model 70 engines are fitted with effective oil coolers which keep the oil temperature at a suitable level even when they are operating under extremely severe conditions. The oil coolers – one for the engine lubricating oil and one for the reverse gear lubricating oil – have the same cooler insert made of copper-nickel tubes which provides maximum resistance to corrosion and maximum dependability.

Fuel filters

An important condition for operational dependability is for the fuel system to function without interruption. For this reason the model 70 engines are fitted with double filters containing paper which has been specially composed for this purpose. Each filter is of the spin-on type and can be replaced very easily without spilling.

The fuel system consists of the feed pump with pre-filter, the fine filters, the fuel injection pump with governor and the injectors.



TAMD 70C

Freshwater-cooled Turbo-compressor for extra high output and, at the same time, low fuel consumption.

Aftercooler – increases the degree of supercharging by cooling the combustion air. This increases engine output.

Heat exchanger – seawater cools the fresh water circulating inside the engine.

Heat fresh

One single electrical connector for motor. T



Starter motor with an output of 4 h.p.

One single connecting block for all electrical connections except those to the starter motor. This simplifies installation.

Oil coolers – one for engine oil, one for reverse gear oil. Cooler insert of corrosion-resistant copper-nickel tubes.

Lubricating oil filter of spin-on type.

Power take-off – or scavenging pump.

Alternator of special marine version, 600W (24 V – 25 A, 24 V – 60 A) or 460W (12 V – 38 A).



THAMD 70C

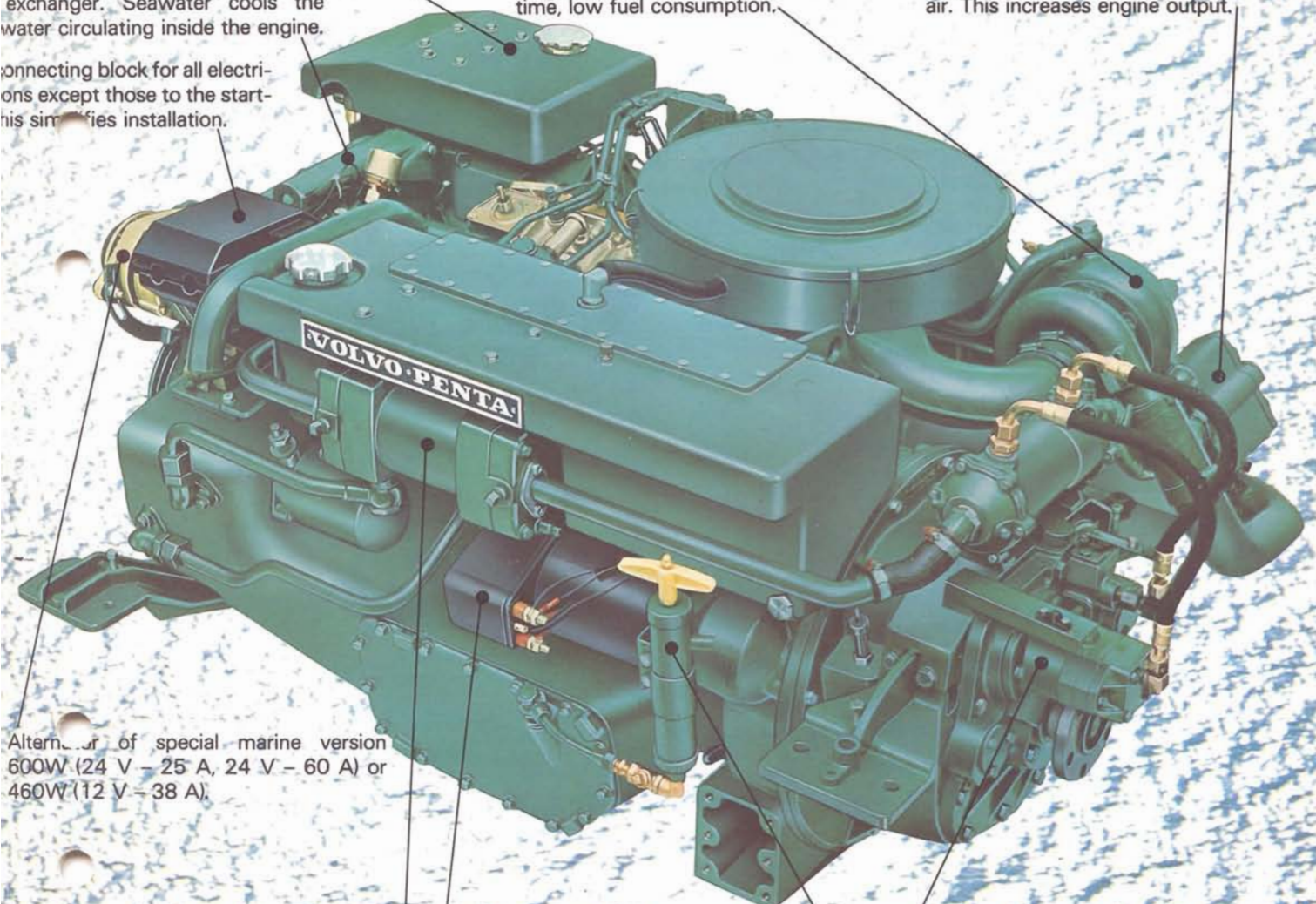
Expansion tank – specially designed to decrease installation height.

exchanger. Seawater cools the water circulating inside the engine.

connecting block for all electronics except those to the start – this simplifies installation.

Freshwater-cooled Turbo-compressor for extra high output and, at the same time, low fuel consumption.

After-cooler – increases the degree of supercharging by cooling the combustion air. This increases engine output.



Alternator of special marine version 600W (24 V – 25 A, 24 V – 60 A) or 460W (12 V – 38 A).

Oil coolers – one for engine oil, one for reverse gear oil. Cooler insert of corrosion-resistant copper-nickel tubes.

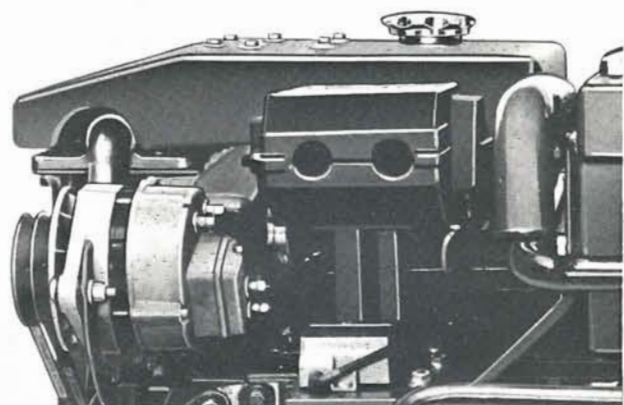
Starter motor with an output of 4 h.p.

Oil pump with three-way cock – facilitates oil changes.

Twin-Disc reverse gear. Available with many different reduction ratios. Dimensioned for continuous operation in both directions of rotation.

Electrical system

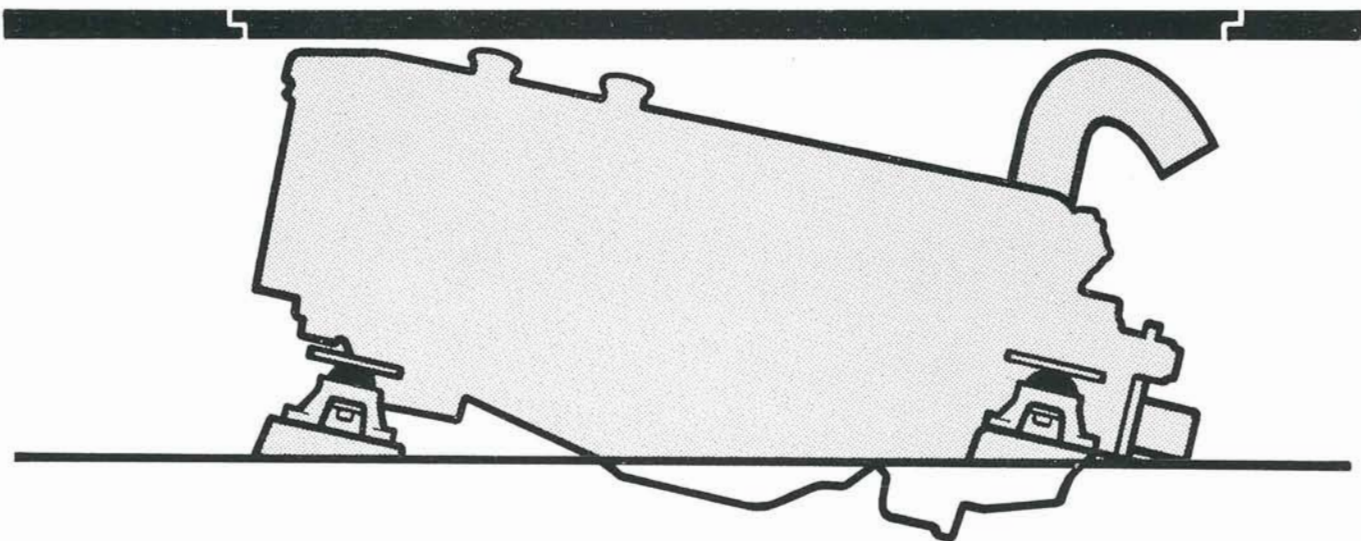
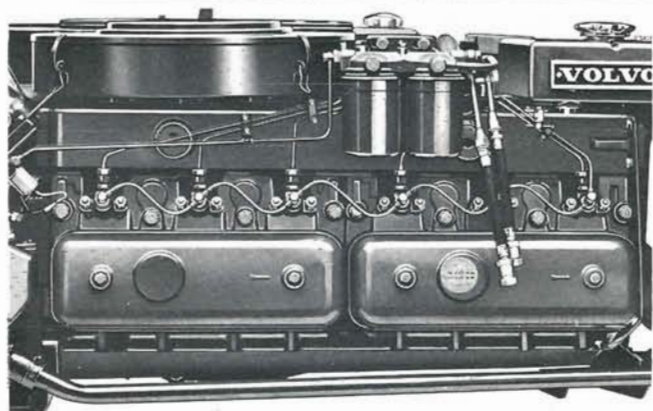
An alternator is standard. Either 600W (24 V – 25 A or 24 V – 60 A) or 460W (12 V – 38 A). The system is of the two-pole type and standard equipment also includes an instrument panel. The alternator is fully transistorized and has a charging regulator which is protected from overvoltage. Output is high even at idling speed and the alternator capacity is quite sufficient for extra equipment. Among the extra equipment available there is a double diode assembly for the automatic charging of two separate battery systems. One single connecting block for all the electrical connections (except the starter motor) facilitates installation.



Cylinder heads

The model 70 engines have wet type, replaceable cylinder liners and separate cylinder heads. Sealing between the cylinder block and cylinder heads is extremely effective: in the cylinder heads there are special sealing slots – and a sealing edge in the liner collar produces a corresponding recess in the cylinder head gaskets which are made of 1.25 mm thick solid steel.

The engine block and crankcase together make up one single unit of special-alloy cast-iron with outstandingly good strength characteristics.



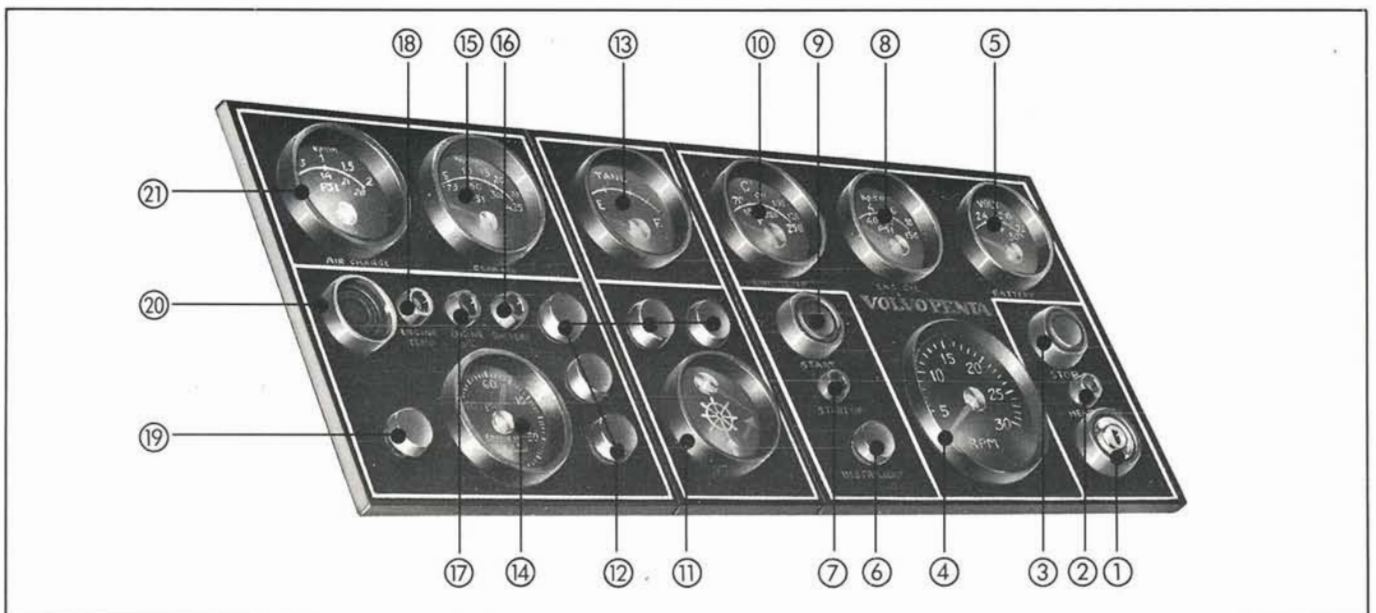
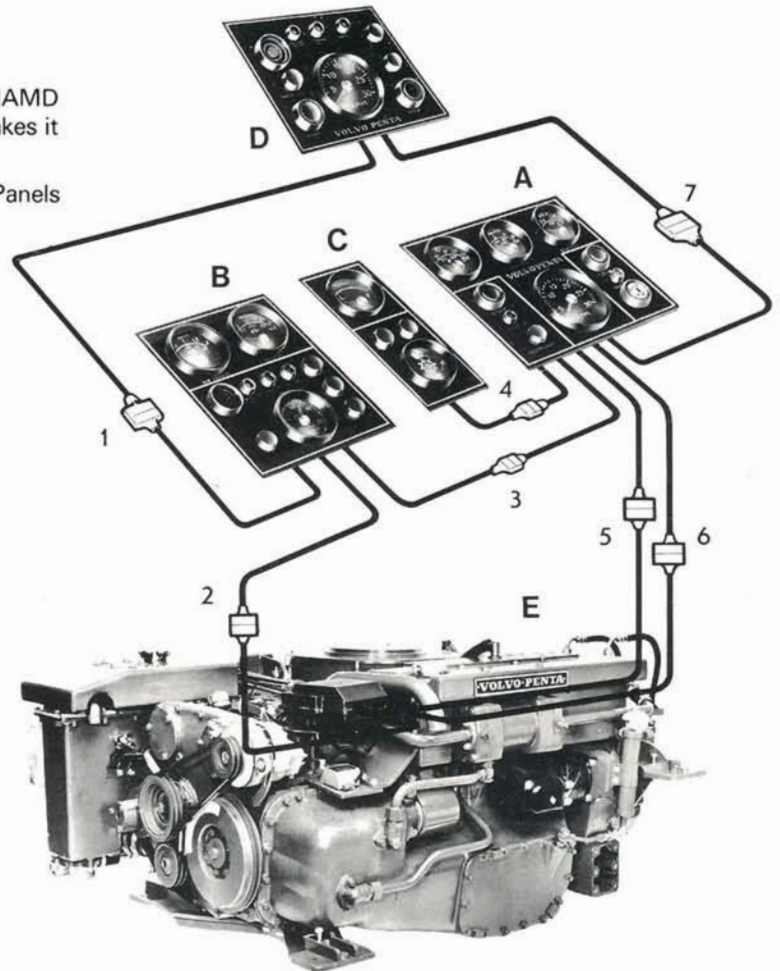
New, water-cooled exhaust riser. Level with the heat exchanger when engine inclination is 12°. Extra low installation height.

Instrumentation

The new instrument panel for the TAMD 70C AND THAMD 70C engines is built up on a module system which makes it easy to fit it to different types of boats.

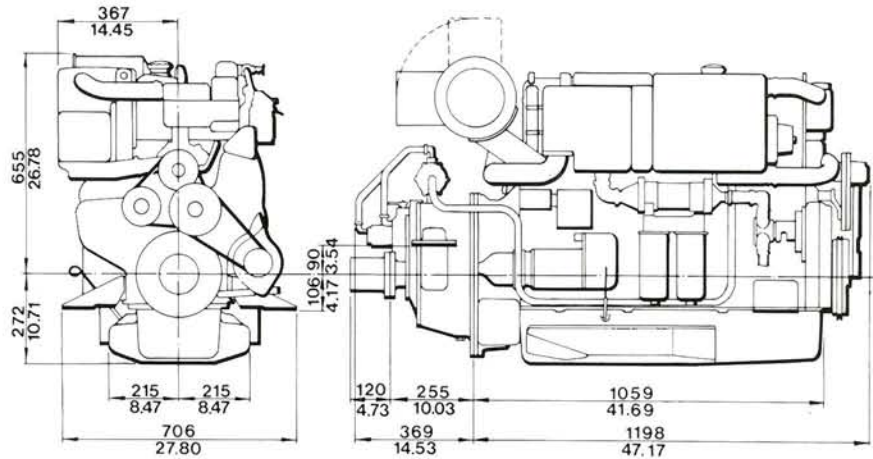
The basic instrument can be seen at A in the picture. Panels B C and D show extra equipment.

1. Starter key
2. Indicator lamp for air pre-heating. Automatic disengagement.
3. Stop control
4. Revolution counter
5. Voltmeter for charging of batteries
6. Instrument lighting
7. Indicator lamp that lights up when air pre-heating has been engaged long enough for starting.
8. Oil pressure gauge
9. Starter button
10. Temperature gauge for engine cooling water
11. Rudder indicator
12. Switch for extra lighting
13. Fuel gauge
14. Hour meter – registers running time of engine
15. Pressure gauge for reverse gear oil pressure
16. Warning lamp for battery charging
17. Warning lamp for engine oil pressure
18. Warning lamp for cooling water temperature
19. Switch for extra lighting
20. Siren – operates automatically if the cooling water temperature becomes too high or the lubricating oil pressure too low.
21. Gauge for Turbo-compressor supercharging pressure.

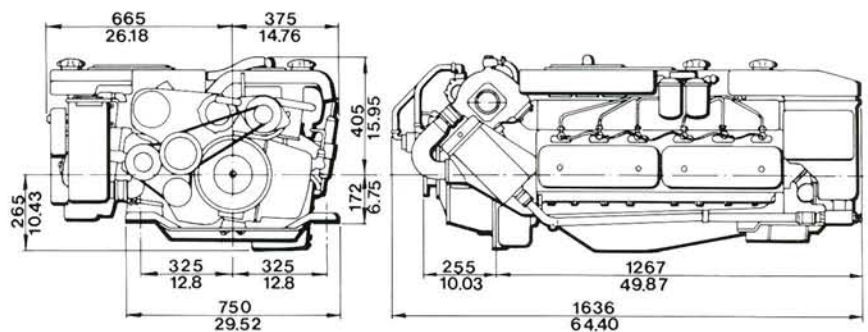


Specifications

Dimensions drawing TAMD70C

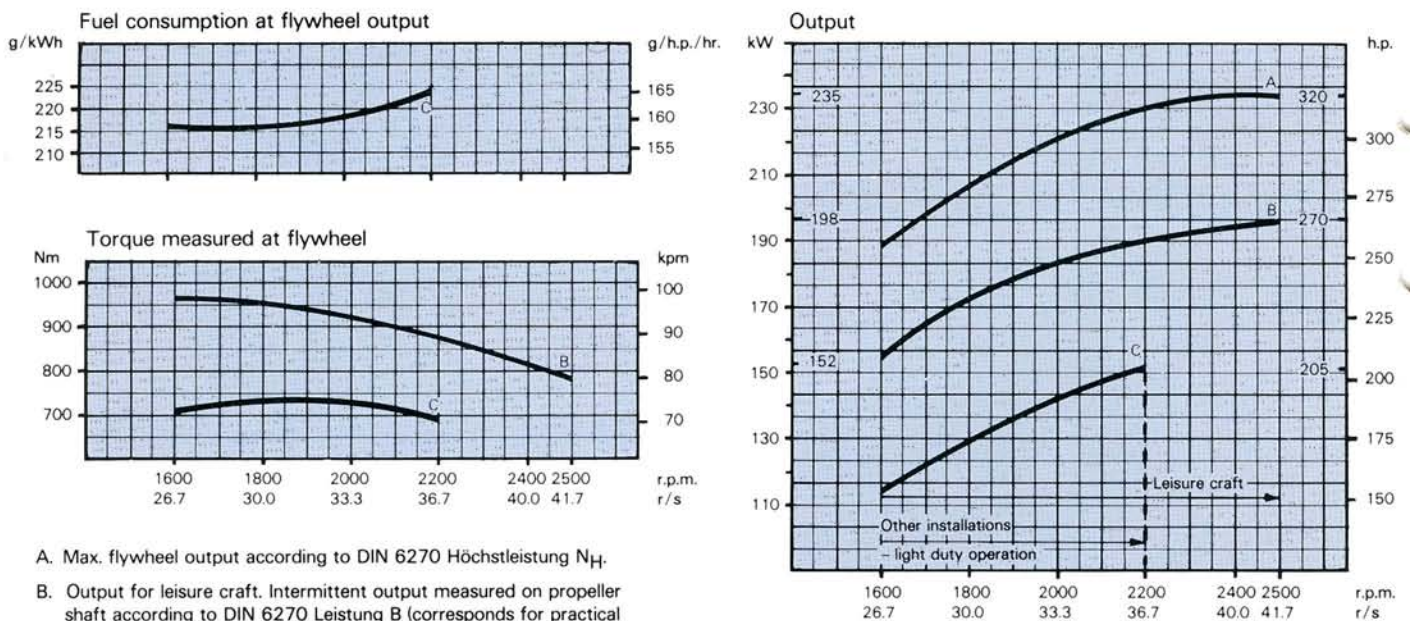


Dimensions drawing THAMD70C



Dimensions shown in mm and inches

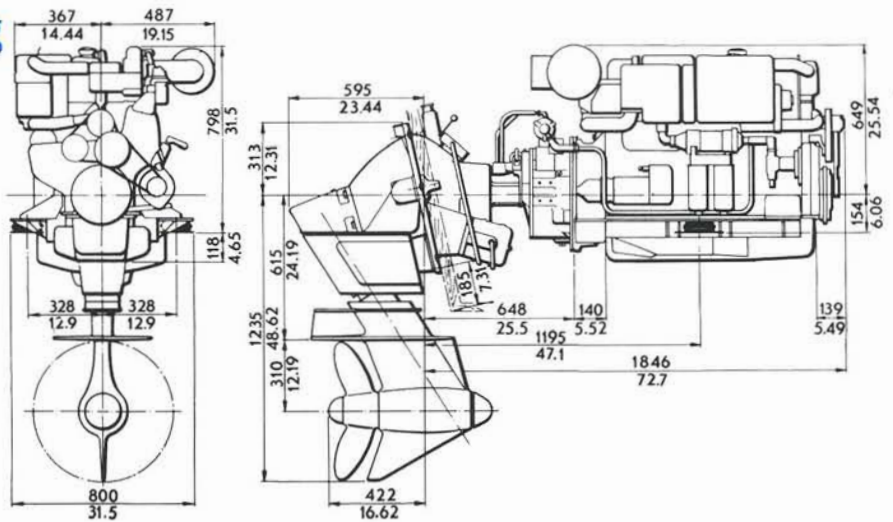
Engine diagram



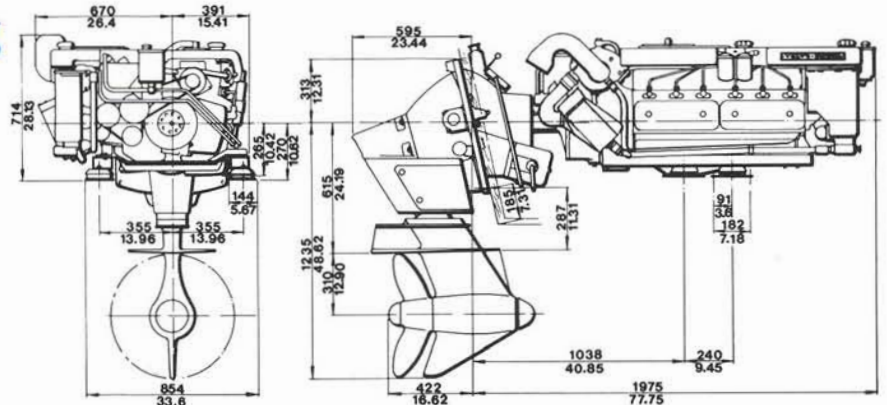
- A. Max. flywheel output according to DIN 6270 Höchstleistung N_H .
- B. Output for leisure craft. Intermittent output measured on propeller shaft according to DIN 6270 Leistung B (corresponds for practical use also to the one-hour output according to BS 649, 1958). To be utilized not more than one hour per 12-hour period. When delivered from Volvo Penta, the engine is set according to curve B 41.7 r/s (2500 r.p.m.).
- C. Output, other installations - light duty operation. Continuous output measured on propeller shaft according to DIN 6270 Leistung B für Dauerbetrieb (corresponds for practical use also to continuous output according to BS 649, 1958). The flywheel output of the engine is about 4% higher than the values specified for the B and C-curves respectively and all measurements concern a run-in engine.

We reserve the right to carry out modifications.

Dimensions drawing AQD70C/750



Dimensions drawing AQD70CL/750

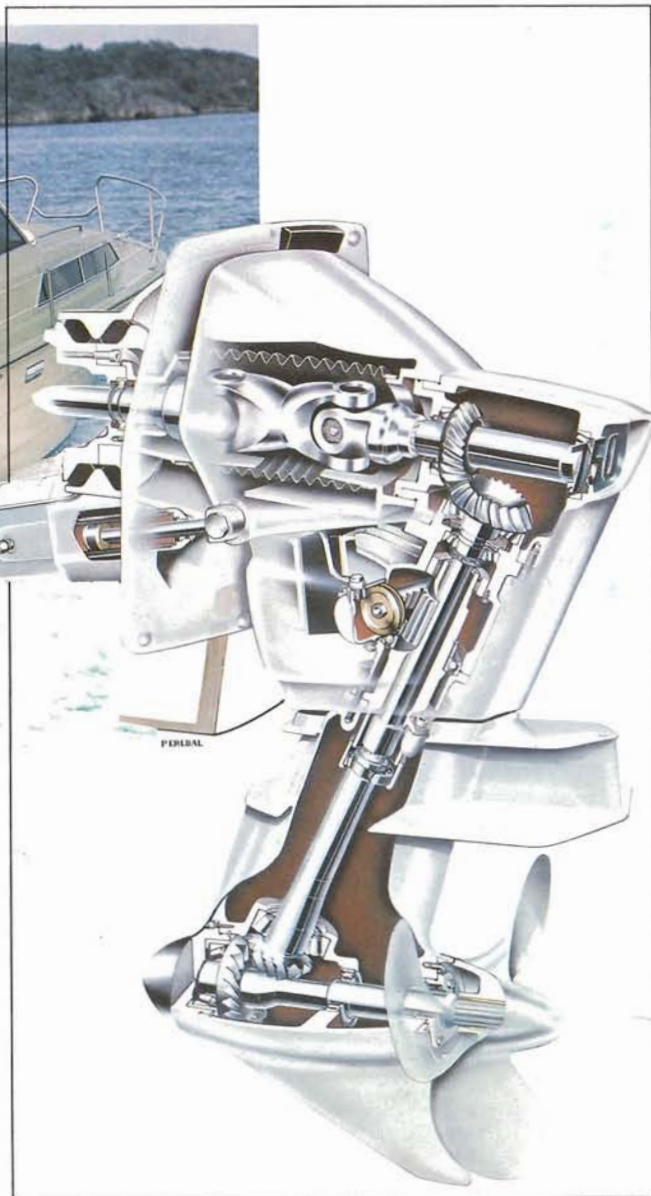


Dimensions shown in mm and inches

Data TAMD 70C, THAMD 70C

Type	Four-stroke, Turbo-supercharged, diesel with direct injection and aftercooler
Propeller shaft output, leisure craft (B)	198 kW at 41.7 r/s (270 h.p. at 2500 r.p.m.)
Propeller shaft output, other installations – light duty operation (C)	152 kW at 36.7 r/s (206 h.p. at 2200 r.p.m.)
Displacement	6.73 dm ³ (litres) (410 cu.in)
Bore/Stroke	104.77/130 mm
No. of cylinders	6
Total weight, engine complete with reverse gear, approx. (TAMD 70C)	920 kg (2030 lb)
Total weight, engine complete with reverse gear, approx. (THAMD 70C)	980 kg (2160 lb)
Total weight, engine complete with reverse gear and outboard drive approx. (AQ D70C/750)	1250 kg (2750 lb)
Total weight, engine complete with reverse gear and outboard drive approx. (AQ D70CL/750)	1305 kg (2880 lb)

Model 750 outboard drive



The Volvo Penta Model 750 outboard drive has been specially adapted for the TAMD 70C and THAMD 70C engines. In the same way as the engines, this drive has been dimensioned for extremely heavy loading and long periods of operation under extremely difficult conditions. Together with the engine, the drive forms a very compact and dependable power package. The Model 750 drive is designed to stand up to the steering forces occurring in relatively large and heavy boats travelling at high speed. That is why the drive has been designed with its characteristic inclination towards the stern of the boat. Steering is carried out by using a patented method: the underwater housing is turned hydraulically.

The Model 750 outboard drive, in common with other Volvo Penta drives, is fitted with helically cut and precision ground gearwheels which ensures extremely quiet and vibration-free running.

The drive tilts up automatically if it should come into contact with the bottom or collide with some object in the water. When this occurs at high speed, special hydraulic dampers come into effect to protect the drive from damage.

Propeller change is easy to carry out since the drive can be tilted up more than 80° hydraulically. On the Model 750 outboard drive, it is also possible to adjust fixed trim positions hydraulically in relation to the inclination of the hull – in order to attain the highest possible speed with the lowest possible fuel consumption.

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